REMARKS

The Examiner is thanked for the due consideration given the application.

Claims 1-11 and 13-20 remain in this application. By this amendment claim 1 is amended to better define X_2 and X_3.

No new matter is believed to be added to the application by this amendment.

Art Rejections

Claims 1-9, 15-18 and 20 stand rejected under 35 USC §103(a) as being unpatentable over YAMAGUCHI et al. (U.S. Publication 2002/0037458) in view of newly applied SCHMIDT et al. (EP 1088814).

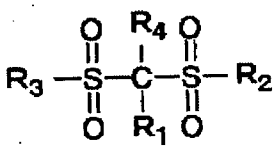
Claims 10 and 11 stand rejected under 35 USC §103(a) as being unpatentable over YAMAGUCHI et al. in view of SCHMIDT et al., and further in view of FLEISCHER et al. (U.S. Patent 6,225,009).

Claim 19 stands rejected under 35 USC §103(a) as being unpatentable over YAMAGUCHI et al. in view of SCHMIDT et al., and further in view of SHIOTA (U.S. Patent 5,795,674).

These rejections are respectfully traversed.

The present invention pertains to a secondary battery that includes an electrolyte solution that contains a compound represented by the general formula (1):

[Formula 1]



(1)

The compound of general formula (1) has two sulfonyl groups, has small LUMO, and is easily reduced because the value of LUMO is smaller than those of a solvent composed of a cyclic carbonate or a chain carbonate and a monosulfonate in the electrolyte solution. Therefore, a reduction film of the compound of general formula (1) is formed on the negative electrode prior to a solvent composed of a cyclic carbonate or a chain carbonate, and plays a role of inhibiting decomposition of solvent molecules.

Since decomposition of solvent molecules is inhibited, a decomposition film of high-resistance solvent molecules becomes difficult to be formed on the negative electrode, and therefore an unexpected inhibition of an increase in resistance and an improvement in cycle characteristic can be expected (See paragraph [0054] of the specification).

Moreover, instant claim 1 of the present invention further defines the compound of general formula (1) where R_2 and R_3 independently represent an atom or a group selected from the group consisting of an unsubstituted alkyl group having 1 to 5 carbon atoms, a substituted or unsubstituted alkoxy group having 1 to 5 carbon atoms, a substituted or unsubstituted phenoxy

group, a substituted or unsubstituted fluoroalkyl group having 1 to 5 carbon atoms, a substituted or unsubstituted fluoroalkoxy group having 1 to 5 carbon atoms, a polyfluoroalkoxy group having 1 to 5 carbon atoms, a hydroxyl group, a halogen atom, $-NX_2X_3$, ***wherein X_2 and X_3 represent a hydrogen atom***, and $-NY_2CONY_3Y_4$.

The prior art does not teach and suggest that the compound of general presently claimed formula (1) is contained in the electrolyte solution in an amount of 0.1 to 5.0% by weight basis. Moreover, when the compound of general formula (1) of 0.1 to 5.0 weight% is contained in the electrolyte solution, the secondary battery has a high capacity maintenance rate and that is an unexpected effect over the prior art (See paragraph [0078], Examples 26-33 of the specification). This represents an unexpected result.

Distinctions of the present invention over YAMAGUCHI et al. are of record in the application. At the bottom of page 3 the Office Action acknowledges that YAMAGUCHI et al. do not teach general formula (1). SCHMIDT et al. is applied to address this deficiency.

The Office Action refers to paragraph [0011] of SCHMIDT et al., which discloses general formula (I):

$$X\text{-}(CYZ)_m\text{-}SO_2N(CR^1R^2R^3)_2 \qquad (I)$$

with

X	H, F, Cl, C_nF_{2n+1}, C_nF_{2n-1}, $(SO_2)_kN(CR^1R^2R^3)_2$
Y	H, F, Cl
Z	H, F, Cl
R^1, R^2, R^3	H und/oder Alkyl, Fluoralkyl, Cycloalkyl
m	0-9 und falls X=H, m≠0
n	1-9
k	0, falls m=0 und k=1, falls m=1-9.

However, SCHMIDT et al. fail to disclose or infer a nitrogen moiety having the hydrogen substitution of the present invention.

The other applied art references do not alleviate the deficiencies of YAMAGUCHI et al. and SCHMIDT et al.

One of ordinary skill and creativity would thus not produce a claimed embodiment of the present invention from a knowledge of the applied art. A *prima facie* case of unpatentability has thus not been made. Moreover, the present invention has results that are unexpected over the applied art (which has been noted above).

These rejections are believed to be overcome, and withdrawal thereof is respectfully requested.

Conclusion

The Examiner is thanked for considering the Information Disclosure Statements filed May 13, 2009, March 21, 2007 and June 14, 2006 and for making the references therein of record in the application.

Prior art of record but not utilized is believed to be non-pertinent to the instant claims.

As no issues remain, the issuance of a Notice of Allowability is respectfully solicited.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

YOUNG & THOMPSON

/Robert E. Goozner/

Robert E. Goozner, Reg. No. 42,593
209, Madison Street, Suite 500
Alexandria, VA 22314
Telephone (703) 521-2297
Telefax (703) 685-0573
(703) 979-4709

REG/lrs